



Innovation in higher education: the effectiveness of disruptive technology in e-learning

Peilin Li

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Author Peilin Li	
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<p>The rising trend of online education, is transferring traditional learning environment to virtual classrooms. People are questioning the relevancy of social platforms for delivering various forms of information from teacher to students. The research question of this thesis is: how disruptive is the present educational technology such as learning management systems and how MOOCs are innovative enough in order to disrupt current higher education.</p> <p>While higher educational virtual courses on Moodle are considered educational and assessed with its school as a certified course. Would MOOCs have created by world-known universities and famous professors also considered relevant for assessing higher educational credits for each study programme. On the other hand, learning environment classrooms are also co-operating with social platforms to form an online classroom where enrolled students could get in touch with other fellow students and also instructors.</p> <p>The thesis is designed to find out the answer to the question how disruptive technology is enhancing learning in higher education. The research is based on theoretical background by explaining key terms and theories what we already know. Practical part is performed with a few interviewees from Haaga-Helia University of Applied Sciences with two groups of Business IT and Tourism students mixed with Multilingual assistant students, thereafter the audio will be transcript and analysed. The result is not disappointing us, though it is produced under a few restrictions.</p> <p>In this research, it is found that the latest in the line of disruptive technologies alongside LMS is MOOC, which stands for Massive Open Online Course. MOOC enables participation of students around the world to learn courses from famous universities. As it disrupted the way students receive the learning material, the forms of content delivery vary. It will be highlighted that e-learning is still more considered as supplementary compared with the interactive learning in classroom.</p>	
Keywords E-learning, disruptive technology, innovation, learning environment system, LMS, MOOCs, Moodle, social platforms, internet economy	

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Terms and Abbreviations

CAI	Computer-assisted instruction
CBI	Computer-based training
ILE	Intelligent learning experience
ITS	Intelligent tutoring systems
LMS	Learning environment system
MOOC	Massive Open Online Course
OER	Open educational resources

1 Introduction

Innovation has its impact on education, however the question leaves majority of people confused: the efficiency of deploying technology applications into education. The new concept of learning online is becoming a trend, people learn from different digital platforms, using various online services to attain knowledge, and the learning is not restricted in classrooms anymore.

Education is staying at a stable mode where it was established centuries ago. The rule of teaching in a classroom is to help students who are slower at their pace to catch up with other students. The question is, how about the students who are naturally faster at learning?

Therefore, the education in most western countries is bounded with government, and the problem rises – it is only a question of time when government will really take any advanced revolution in education. Since elders are dependent on people who are working, government is nurturing future workers, who are or will be students one day. In fact, the e-learning is helping more people to educate themselves, even without paying too much and having an absence on a regular basis at school.

For example, students can take additional courses according to their interests to fulfil the requirements of their free elective studies. What is more interesting, is that there are many of schools offering totally online based education for business degrees.

In this fast growing digitalization of social activities, people are spending more time online, in another words, people are creating digital information all the time. For the scope of globalization, the information is being viewed by global citizens, due to its vast amount of possibilities of people to discover its content online. Today learning online is becoming mundane, it maybe subconscious action, for example searching how to DIY from YouTube is already learning something online, though this is learning from a social channel.

Secondly, there is an increasing significance of online education platforms, the MOOCs, and Moodle, through which schools are providing course information and updates. There are for example edX, Coursera, Eliademy for digital learning platforms, of which some are commercial and/or non-profit organizations.

Concerning effects of online learning about technology integration, the implementation of learning through virtual classrooms are increasing its popularity. Partially, as a learning platform, Moodle has already provided supportive functions to enhance the traditional learning environment. Teachers are posting common instructions and announcements for all participants online, which also serve as a manual of how to complete the course.

Social media platforms are integrated within learning management systems (LMS) for enhancing the learning experience, such as video recordings and presentations with recorded audios. The phenomenon of the teacher's presence creates a kind of continuous learning experience, which is not restricted by a single lecture but can be manually repeated by its content.

1.1 Goal of the Thesis

While innovation becomes prevalence, disruptive technology is enhancing with higher education in e-learning. With an introduction to current technology applications and their effective usages applied within higher education, the goal of this thesis is to review selected significant past and present trends in the applications in education, and project successes and failures as well as limitations to possible future implementations in a general level. The main research question is, as the title stated, to find out the answer to the question whether disruptive technology is enhancing higher education in e-learning. The approach leads to sub-questions that can be the following:

- What are the key terms defining innovation in higher education?
- What is disruptive technology and what does it mean in successful implementation of a disruptive breakthrough in higher education?
- What are the current solutions and applications for e-learning in higher education?
- Are there any problems facing in e-learning and what are the possible countermeasures for improving the methods?

The research is based on theoretical background by explaining key terms and theories what are already known. Practical part is performed through few interviews with students studying business information technology and a blended group of tourism and multilingual assistant programme from Haaga-Helia University of Applied Sciences. Later, the records will be analysed with transcript. The result of the analysis of the interview is quite satisfactory, even though there can be some limits in the research.

1.2 Scope of this thesis

The pedagogical material providers are adapted to use the digital platform to deliver information that reaches audiences. According to Chesbrough (2003) innovation has an impact on our social practices, changing the way people work and learn. How would the disruptive technology be defined as disruptive and would they really have a positive impact on the way how people learn? The scope of this thesis is how disruptive innovation is emerging and what impact does the student-centric learning experience have on the process and outcome of learning.

Another aspect is to dig into history of e-learning. How disruptive innovation is emerging and how motivated were educators involving and anticipating in further developing the service.

1.3 Out of the scope

In this research thesis, no opinion is included other than that of students of Haaga-Helia University of applied Sciences. The comparison is carried out between different campuses and study programmes. Even though, problems of plagiarism were mentioned in the research, the mobilization of the cloud computing, security problems using personal devices, such as smart phones and tablets are not included in the thesis. Also, the perfect countermeasure for adjusting the technology to education are not covered neither the linkage between learning management systems and current technology competence applied in education.

2 Background theory

This section will begin with defining key terms of the thesis as well as current emerging phenomena and technologies performed under educational experiences. A brief description of their emergence will be introduced in subsections, the similarities of the concepts will be distinguished and explained in terms of potential effects of development in the future.

2.1 Innovation in Higher Education

Innovation is by no means different from invention. Henry Chesbrough (2003) stated that innovation means invention implemented and taken to the market. Where beyond the innovation lies disruptive innovation, which actually changes social practices –the way we live, work and learn. For a successful disruptive innovation, the first challenge is technological breakthrough in terms of the products it enables, and how are they shaping the social practices if they are having huge payoffs, both to the innovator and to society. Another challenge is that a successful innovation usually needs an innovative business model and also demands an innovative product offering. (Brown, and Seely 2006.)

Christensen (2008) mentions that disruption is a two-stage process, where the first phase is that the innovator makes a product substitute to the existing product more affordable and easier to use. To be noted that making and building the new product is more expensive and complicated. In the second stage of disruption is called modular design, it is the shortcut to building and upgrading the products in a simple and inexpensive way. (Christensen 2008).

Lectures are held as production of knowledge, the delivery methods in-class are being transformed from spoken lectures to showing various forms of information such as multimedia. The interactions between students and teacher has increased, also peer-to-peer interactions enabled. The learning journey has developed into a collaboration between these factors of participations.

The aim to allow school ICT strategy development and support decision making, and the use of using portable ICT device per learner is rapidly becoming a trend in many education and training sessions in higher education. Schools deploy laptops, smart phones or tablets to support teaching and learning both online and offline lectures. The capital investment may burden the budget by schools and funders. Depending on various approaches to implement bring

your own device (BYOD) concept, participants are encouraged to bring their personal electronic devices to the lectures to take advantage of enhance teaching and learning. (Attewell 2015.)

While the dominant age of television transfers to the future of digital data which presents on personal owned machines such data that are unlimited by its content. The descendants of TV viewers are moving to the digital platform where one could order certain types of content one want, determining the time of the arrival time and even the form of the content. Gilder also concluded that the technical changes would affect institutional changes among with negation of mass media such as broadcasting stations and centralized telephone system to client-server networks and networks for individual uses. (Gilder 1993, 95.)

2.1.1 Digital revolution

Among the big three Information revolutions, beside Gutenberg Revolution and scientific revolution is the digital evolution in our era. Digital revolution is a combination of digital transmission, digital processing and digital storage. The revolution is being defined due to its nature of impacting society and the economy; it transferred the management of records by from organizations to businesses. Thus, the bureaucracies are no longer dependent on concrete files and space for storing data. The significance of completing communication via world wide web in 1989, and electronic mail, which was already mature in 1993. In the other words, the digital transmission was originally dated back in 1906. When tele printers and the telex network was developed in 1930s, the development was fast and furious in the 80s. (Moodie 2016, 9.) It is predicted to be overtaken by quantum computation and communication mentioned by Wiseman (2012).

On the other hand, the digital revolution in one case had proposed libraries to focus on information literacy development for the information age of society (Castells 1996). Anderson (2004) observes the internet enables suppliers to aggregate from the whole world the long tail of demand from customers which has a small demand within any city or region. Thus, information literacy is made available and reachable for everyone.

This all was presented by Bush in 1945 when he suggests that a future device for individual use, a sort of library like mechanical and private thing. The device was given a name ‘memex’ which is a device where an individual could insert and store all forms of information. All these are mechanized so that it may be consulted with exceeding speed and flexibility – to supplement his memory capacity. (Bush 1945)

Personally owned devices as for bringing to schools, education is increasingly deploying and supporting laptops, tablets and smartphones to assist teaching and learning both inside and outside classrooms. Computing has expanded to many learners, each device is being used different ways to enhance learning contexts. (Attewell 2015). The criticism of education for not taking enough advantage of new technologies is however, not the stimulus for major change in education. There lie several reasons for medieval universities not applying such effective ways of adapting new technologies into their school systems as an entity. (Moodie 2016, 11.)

The restriction of a paucity of resources in comparison with modern universities are that developed in developed countries the policy is encouraging spending on higher education in which uses of other resources, technologies, in order to make universities more efficient. Therefore, the combination of financial, technological, and physical resources available to universities to shape their school systems as business entities. (Moodie 2016, 12.)

Moodie has noted that the digital revolution may not be revolutionizing higher education because higher education has yet to develop a radical new method for managing knowledge for teaching-learning. Since the pedagogical challenge transforming learning methods and materials into other forms means a different method of learning for students. Disseminating disciplinary knowledge has different conditions from those for disseminating mundane knowledge. It is more difficult to imagine disseminating disciplinary knowledge in communications are of length of a journal or a book. (Moodie 2016, 13.)

2.1.2 Artificial intelligence

The two approaches which are ITS and ILEs, to project possibilities for artificial intelligence and knowledge-based systems in education. The diversity of application of AI in education is profoundly interesting objects of two different aspects proposing the fact that ILEs is completely student-controlled and the other tutor-controlled ITS whereas teachers play a role of a guide in the field. (MacArthur, Lewis., and Bishary 2005).

Throughout the time, educators have looked to educational technology to increase productivity of students and teachers in a straightforward way. Past technologies including CAI systems and most ITS, have already offered such set of tools for educational uses, it is to be noted that most of the applications only changed the way the content is delivered. It is to be predicted that AI applications may follow the previous route, however in the future new information

technologies are redefining how professionals do their jobs and what are those jobs. (MacArthur, Lewis and Bishary. 2005.)

While implementations required when integrating ITSs in classrooms as well as ILEs for reaching out new goals and methods deliverable. Proportionally it requires more effort, as technology continues to transform the methods for learning and teaching. These tasks are mentioned by MacArthur, Lewis and Bishary (2005):

- The demand of new curricula
- New methods and instruments as well as for assessing the outcomes
- New teaching practices and professional standards
- Continues training for teachers

Similarly, the main point is that artificial intelligence and knowledge-based systems neither support ‘instructionist’ or ‘constructionist’ views of teaching. Future mixed-initiative technologies will be predicted to strongly control the learning interaction. Regardless of how rigid the procedures of drill-and-practice or lectures are; AI will expand to represent models of subtle reasoning skills. The final destination for AI is not to replace teachers and peers in the classroom but more likely to change their roles. (MacArthur, Lewis and Bishary. 2005.)

Artificial intelligence, has the potential to enhance online learning, adaptive learning software, and research processes in ways that more intuitively respond to and engage with the students.

2.1.3 The MOOCs society

MOOCs are shortened from Massive Opening Online Course, which is standing for unlimited participation and open access via the web worldwide. It was first introduced as a platform for students who are learning from distance and in which the pedagogical material is planned and prepared by educational institutions, who also offer licensed courses for completions. (Kaplan Andreas M., Haenlein M. 2016.)

The MOOCs are having this special mission of expanding access to education worldwide, also pursuing the innovation of educating people online along with their partners. (President Rafael Reif. MITx on edX(MOOCs)) However, the scepticisms of whether MOOCs are leading to educational changes or misleading people purchasing courses that are near-impossible to fail and that are said to be correspondence colleges. (Shea, Michael. 2015).

However, there are some future brightening offerings about online courses. Daphne Koller, who formed the Coursera is aiming for an education, that is the best quality to the number of people possible. With the best instructors at the best universities, are completely free. Online courses have made many opportunities for people who had not have the chance to afford it. (Koller 2012)

2.2 The right structure to disrupt – Transformation

Advancing knowledge with combining both technology and traditional classroom learning, to the extent of blended learning. The simplest explanation to the term blended learning is the integration of contact lessons with virtual learning sessions. To begin the challenge of combining the strength of synchronous and asynchronous learning activities, therefore determines a complex implementation of the development. (Garrison, Kanuka 2004, 96.)

While advancing knowledge the core issue is the reliability of assessing learning material into forms that effectively integrate internet technologies with the most affective and characteristics valued of contact lessons to perform together within a quantum shift of the educational experience. The concern lingers between the quality and the quantity of the engagement in the environment of education. (Garrison, ClevelandInnes 2003; Swan 2001.)

In the meanwhile, disseminating knowledge means spreading out the knowledge without boundaries. In higher education, the accessibility of open information can have a huge impact on building a learning organization. Focusing on the increased importance of technology applications used with knowledge retrieval and sharing for the social and economic well-being. There'll be identified potential technology programmes in response for nurturing a vital civic culture and progression on society. (Walshok, Lindenstone 1995.)

UNESCO is active on promoting Open educational resources (OER), which indicates that research materials as well as teaching and learning materials are under public domain or that can be used under an intellectual property license that allows reuse and adaptation. The main drive behind the force is to open up possibilities for those in weaker situations have an opportunity to achieve quality education. (UNESCO 2017.)

On the other hand, Open education consortium stated that sharing is the most basic characteristic of education, it is enabling knowledge, insights, and informational content to be put open with others. Even if the understanding is not definite but sharing is considered unlimited. Though, the openness in education does not mean free access to education but rather the

open content and educational resources, the open possibilities and open peer learning in its context. Open education is more of a philosophy of how open education is enabled. (Open Education Consortium.)

The example design of the courses is to be implemented as following, since critics of MOOCs argue that the courses lack of adjusting caused confusion and severe workload that is enable to finish by deadline. The 7Cs of learning design framework aims to provide a complete framework to support teachers an effective use of new technologies. The following elements are presented in following graph:

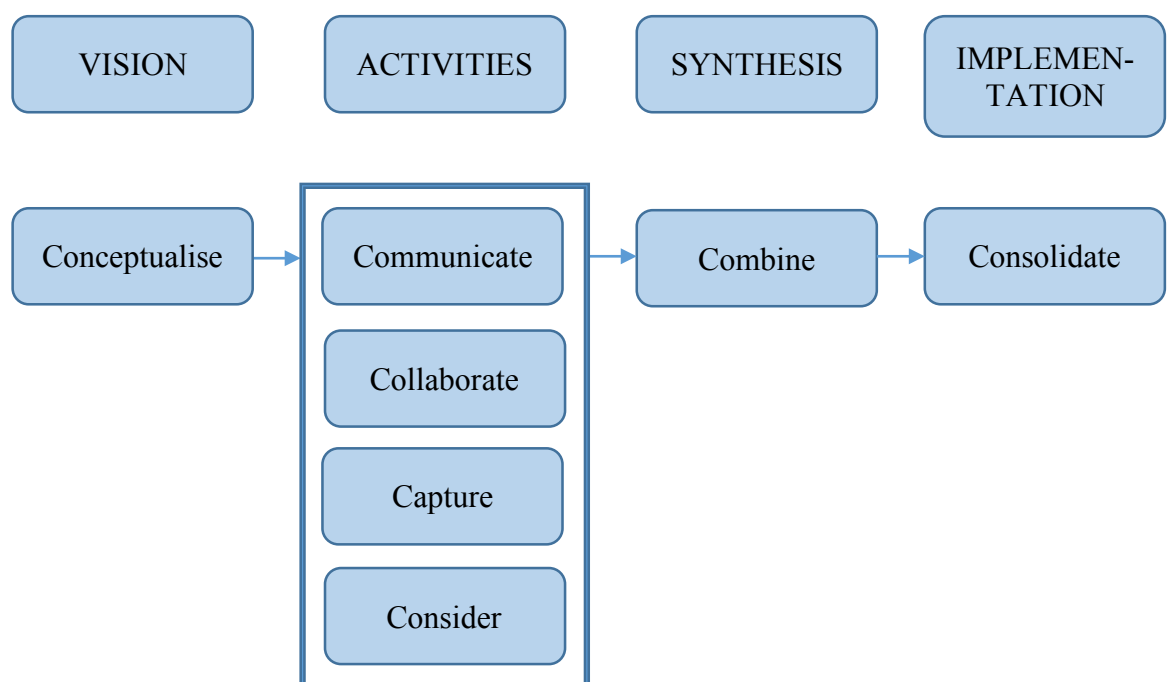


Figure 1 The seven Cs of Learning Design Framework (Conole)

The graph represents the stages of elements that will be adjusted in order to transform learning or teaching materials from pedagogical aspects. The first phase is visioning and conceptualising the course. Next, the core activities that the course holds composing of communication, collaboration of relevant mechanisms, capturing an audit and considering assessment strategies. With the synthesis of the earlier stages the final outcome is to put them in one to produce a successful implementation, consolidating an evaluation that is ensuring the quality and effectiveness for the course design. (Conole 2010, 11.)

2.2.1 Student-Centric Approach

Learner-centred teaching is brought up by Maryellen Weimer (2002, 21-119) including five key changes to practice in her book. The consequences after her findings, are that there are shifts to establish a totally new approach to educating people in higher demands. When focused on learner-centred, content is being used not covered, and it is used to establish a knowledge foundation. Therefore, content materials are used to develop learning skills.

Fortunately, a positive response to student concerns are the centricity and main focus on students who are learners in this position. Weimer's criteria (2002) acknowledges that changes happened in learner-centred classrooms teacher can achieve course objectives more efficiently engaging the students to increased performance during their course accomplishment over time. These five characteristics are the balance of power in classrooms, the function of content of what is being taught in class, the role of the teacher being the authority and the responsibility for learning. Lastly, the purpose and processes of evaluation. (Weimer 2002, 21-119.)

These approaches are adapted into virtual classrooms. As such, student-centric technology is based in modular design, which allows application developers to design and build their own customized operating systems. Platforms are emerging, the involving parties of the learning management systems such as managers of the platform, teachers, students, and even parents take part of designing and adjusting tools that help students to learn. (Christensen 2008.)

2.2.2 Personalized e-learning systems

As multiple of classrooms are gone viral, the forms of teaching are being suspected. Since learning is enabled virtually, it is being questioned whether education should be shifted into totally online. However, the argument does not make it path to success, education may be revolutionized but the learning process of human happens in an old-fashioned way. Kolb has identified four modes in learning cycle, which are applied even today for self-assessment survey. They are concrete experimentation on doing something oneself; reflecting on the learnt material; abstract conceptualization in which one talks about the materials learnt and applying the same content to the real situation; and the last one active experimentation. (Kolb D.A. 1984.)

The personalized e-learning system shall be revolutionized based upon the differentiated learning styles brought up by Kolb and Fry (1975) which are converger, diverger, assimilator

and accommodator. Depending on each learner's way of learning, e-learning does enable a diversified way to enhance learning by putting different forms of learning materials into the one course. For a combination of online classroom learning and face-to-face learning, a new way of learning is introduced as blended learning. The student is able to control, at least in some part, controlling the time, place, path and pace. Also the portion of online sessions and contact lessons are able to measure in some context, vastly depending on the course nature. Although, there are different sub models of blended learning to make a creation of successful projection of the content delivery, the integrity of learning experience is the main focus. (Horn M.B. and Staker H., 2014.)

For more personalized e-learning an item response theory is being invented, it is applied in the computerized adaptive test domain to select the appropriate items for examinees based on individual ability ((Baker, 2001; Baker & Frank, 1992; Hambleton, 1985; Horward, 1990; Hsu & Sadock, 1985; Hulin et al., 1983; Lord, 1980; Wang, 1995)). The service is proposing a personalized e-learning system based on item response theory, the computerized adaptive test (CAT) is not only efficiently saving up time, resources and also enabling better performance at a higher level of resolution proposed by Horward (1990). (C.-M. Chen et al., 2005, 237-255.)

On the business side of the education systems. Considering the education as an entity of a firm, the innovation strategy uses to leveraging resources and ideas outside of the walls of the enterprise. Individuals are enabled to distribute in same channels across the globe despite the geographical location with other individuals who share the same interests and affinities. The common of exploiting use of both external and internal ideas to expand boundaries between organizations and communities widens up the perspective of competitive advantage. Paths to market are multiplying as well as the integrated ideas of firms advancing their technology. (Dahlander et al. 2011).

2.2.3 Difficulties opening an online course

For opening a course, it's not only a matter of pedagogical challenge because transforming teaching materials from a concrete presence to an immaterial text in an online channel. Another challenge is how to get students engaged with the virtual course since registered amount of students are more than the ones who actually finishes the course and on time. There are interesting statistics found online. The number of students taking distance learning course at the postsecondary level were 5,522,194 students enrolled in any distance education courses at degree-granting institutions in US (NCES 2013).

Number and percentage of students enrolled in degree-granting postsecondary institutions, by distance education participation, level of enrollment and control of institution: Fall 2013										
Level of enrollment and control of institution	Number of students					Percent of students				
	Total	No distance education courses	Total, any distance education course(s)	At least one, but not all, of student's courses are distance education courses	Exclusively distance education course(s)	Total	No distance education courses	Total, any distance education course(s)	At least one, but not all, of student's courses are distance education courses	Exclusively distance education course(s)
Total	20,375,789	14,853,595	5,522,194	2,862,991	2,659,203	100.0	72.9	27.1	14.1	13.1
Level of enrollment										
Undergraduate	17,474,835	12,847,210	4,627,625	2,645,183	1,982,442	100.0	73.5	26.5	15.1	11.3
Postbaccalaureate	2,900,954	2,006,385	894,569	217,808	676,761	100.0	69.2	30.8	7.5	23.3
Control of institution										
Public	14,745,558	11,001,316	3,744,242	2,462,362	1,281,880	100.0	74.6	25.4	16.7	8.7
Private nonprofit	3,974,004	3,178,594	795,410	275,020	520,390	100.0	80.0	20.0	6.9	13.1
Private for-profit	1,656,227	673,685	982,542	125,609	856,933	100.0	40.7	59.3	7.6	51.7

Figure 2 U.S. Department of Education, National Centre for Education Statistics. (2016). Digest of Education Statistics, 2014 (NCES 2016-006), Table 311.15.

Creating an online course could be viewed as participating in a public education, due to its nature several platforms including Edx, Coursera, and Eliademy are offering these courses available for everyone. However, it is to be carefully implemented how the criteria of one attending the course and its prerequisites. Beside the Learning Management system (LMS), there are tons of cost-free Web 2.0 applications available. Everyone lives in a new, interactive, and collaborative Web 2.0 world with many mainstream internet technologies and applications available for use in the online classrooms (Swenson 2012).

LMS in Universities are offering multiple already existing tools and templates for each course module creation, also collaboration is made more accessible. Within LMS it may be easier to arrange course contents with templates for example for displaying syllabus, schedule, assignments, important links, contact information and other course materials. All added features are most likely embedded within the LMS for easy access and navigation (Swenson 2012). The anti-plagiarism program integrated for example in Haaga-Helia UAS has Urkund, other universities might have used similar programs.

Web presence beside LMS is considered, and established along with LMS. Nowadays the massive open online course has revolutionized open and online learning on monumental scale (Mackey 2014). As a result, educators are put under pressure of rethinking the teaching method, and new ways of delivering values and how to reach effectively enough to help people receive them. Social media enables information literacy to self-publish and collaboratively moving into an enchanting movement. Metaliteracy initiatives and the Semantic Web for developing connected, open, and interoperable spaces for knowledge production and sharing (Mackey 2014).

2.2.4 Social media roles in LMSs

Considering social media platforms as widely used communication equipment, the trends in receiving information are shifting from passive receiving to interactive participation. Regarding to digital use of teaching, it is possible to create both synchronous and asynchronous online courses allowing students to involve in real-time discussions via range of resources and devices while providing delayed communications for example sending emails. Social media is promoting and integrates the sharing of information, which in forms of visuals, textual, auditory and videos.

Enabling communications between students and teacher outside classroom online might be categorised as overworking. However, it really depends on each individual teacher engagement of a teacher's role and responsibilities. At least for social networking Facebook is among the most popular avenue for communication. Facebook has this feature of creating groups; disseminate information and graphics; share pertinent quotes and texts, including links, photos, and multimedia; to emerge learning experience with students with a slight personal touch.

Other online presence mentioned are Google Docs for sharing contents (relevant files) to students; Blogs for keeping diaries and notes for additional information and instructions; YouTube for hosting lecture recordings and last but not the least, Skype for one-to-one conversation or conferences (and it does require to have a paid plan to have members more than 5). Similar and additional mainstream options are available for other part of continents in the world for example Russians use VK, Chinese people use WeChat for communications. There are also project-oriented approaches for team-working for example Slack and Trello.

Traditional teaching in classrooms shall not be replaced, because the interaction face-to-face between student and teacher is more crucial in learning and receiving information and the content. However, it is considered to develop learning experience from Moodle to MOOC platforms, since eager learners will be able to access to the content completely free or attain certificates from purchasing. People's response mechanisms to visualizations are ground breaking, since emotions play big part of human lives; emotional responses are detected from any forms of data depending on the subject matter, the source and the location, any visual elements. (Silvia S. 2016). Universities are responsible for maintaining a high-quality civil society stated by Holmström (2015).

2.3 Feedback systems improving course development

Beside using LMS within school's own system, the recommendation of establishing own web presence using third party platforms are popular. Since, online colleges attract all of the most

successful professors from around the world and allows them to teach an unlimited number of students over the Internet (USA College Conspiracy 2011). MOOCs are rising its popularity among learners worldwide, not only college and university students but also people with interests.

Feedback is more than a post-assignment commentary (Mandernach PhD and Garret 2014). Students are highly welcomed to give feedbacks, because often students are required directly to express how they did with time management, efforts used, how was the motivation level, and whether they are meeting their expectations of the results. It is to encourage students to motivate themselves to do better next time or during next virtual courses, and suggestions with how to improve the course with higher quality. (Mandernach PhD and Garret 2014).

Secondly, feedback system can be viewed as a learning journey of what should have been done and other aspect could be improved within the course. Although, course designers forgets that establishing an online course is similar to prototyping a service to the end-users, which in this case are the students. End-user involvement and satisfaction is important so that course creators could adjust to students' needs and wants, for pursuing and for them to receiving the best possible quality of learning experience as a service journey (Doll W.J., Torkzadeh G. 1988).

Thirdly, the feedback systems are designated not only to students but for the teachers as well, they need real feedback. According to Bill Gates, his founding on a project called Measures of Effective Teaching has some suggestions including having a camera recording class sessions. The recorded sessions are going to be learnt by the teachers, for personal reflection on teaching strategy, methodology and classroom management, all the different facets of the classroom could be analysed. The intrinsic exposure of teaching help teachers to understand, and then help the broader communities understand what this is really about. (Gates B. 2013)

3 Research plan

The research method will be divided to two, first part is to digging into theories, defining key concepts and existing theories as well as models that other researchers have found or defined or have proposed before. The theoretical framework is a base for scientific research it supports my problem statement and research question(s). Determining what theories and ideas exist related to my chosen topic gives my research a direction so I would choose book sources that are from university libraries and take some examples from other dissertations for example from THESEUS- thesis database. Online sources from trustworthy publishers, other notable universities' research results, and publications. After reading few books of sources for theoretical part, some relatable information is underlined and referred and cited to be a part of the thesis.

I chose qualitative interview as a method for empirical research, since the researcher and the interviewee will have a personal conversation on a particular issue with several leading questions of course. It is also more valuable since detailed data that cannot be obtained through questionnaires. Even though, getting the transcriptions done from voice-files could be frustrating, I'm excited to analyse the similarity of those honest feedbacks and data that of first-persons. Thus, the second phase is to get the interviews done.

After listing the interview questions finding nominees of the two different groups of interviewees. To book time for face-to-face interviews approximately 10-15 min per person. The interview will be both face-to-face interviews and skype-interviews, selected people who are learning or have learnt through virtual courses will be interviewed. Most of them are familiar with the learning management system such as Moodle and MOOCs.

The interviewees are selected from Haaga-Helia University of Applied Sciences of two different major, one group has done or doing a degree programme in business information technology and the other is constitutes of tourism and assistant degree programmes. Choosing different groups of interviewees has a meaning of differing their learning content, since computer science is interactive with the technology and the other demands much more conversational competency with other human beings. The interview will be recorded in file of voice or video, afterwards the derived transcript will be analysed.

The last part of my research plan is to get the results obtained from collected theories and analysis from interviews. Combining the relations of the theoretical and the empirical part constructed with qualitative interviews, bringing out interpretations of both positive and negative results.

3.1 The research questions

1. What is your current major (in higher education)?
2. Have you ever used online courses and how would you recommend them to fellow students? What kind of courses, areas of studies did you took online?
3. What do you know about technology and learning management systems(Moodle)?
4. Are you an enthusiast of classes and courses online? Tell me about your opinion about the teaching materials and qualities used in online courses?
5. What about the online classes now available free on the net from major universities such as Harvard, MIT and Stanford?
6. Is there an optimal number of students per classroom in the online course?
7. How do you experience the idea of student-centric approach of teaching?
8. Are you satisfied with the results/learning experiences from online courses?
9. Do you feel you have actually gained more than having class offline?
10. What do you think of the future of online universities? And yourself benefiting from it?

4 The Actual Development

Innovation is a misleading word. People are talking about innovations throughout the time, but what is the real invention that disturbed the vintage teaching style. Unfortunately, most of us students are still sitting in front of the desks and learning passively. Active learning is encouraged but course content including main theories are only applied and experimented when it is time to do an exam that ends up with a course grade. The differences are that people are still engaged with concrete things, such as printed out course materials, an instructor that answers questions in real-time without time-zone delays and of course a paper version certificate with signature from world-class-schools.

Innovation is a fancy word for many students when they were first introduced to the term. People want to label their inventions as innovative as possible, to attract new customers and to introduce their product to the market.

4.1 Technologies applied in e-learning

E-learning is not a new word but it may vary by its contextual meaning, since it means in terms as electronic learning – long before the internet was familiar to people, distance courses were already existing for students with education in certain areas of studies.

Learning management systems are known in schools as Moodle platforms providing student data and information of the courses, also allowing basic interactions with teachers and other students. Though, it is recommended to send an email instead of sending a message through LMS platforms. Learning management systems may be outdated and poorly managed as described from the respondent majoring in Business Information Technology at Haaga-Helia University of Applied Sciences. The respondent was nearly reluctant to separate functions of the Moodle platform they are using at the moment, since many functions are not needed -simply not in demand of a student. Therefore, some functionalities are being hidden, for example searching for a certain course offering from the Moodle is not enough, it is required to sign up in WinhaWille which provides significant course selections for students to apply each year. However, the respondent uses Moodle for checking the course content, and sometimes checking the materials and does hand in the assignments before deadline.

One of the most popular for electronic learning is an open source web application called Moodle, which had the name originated from Martin's Object-Oriented Dynamic Learning Environment and later derived into a form of Modular Object-Oriented Dynamic Learning Environment.

Students get basic course instructions and set of assignments' deadlines to complete. The content is commonly linked to another platforms as providing reading materials across the web, for example an online library across the nation called FINNA.

Other multimedia forms such as video, sound clips and articles are presented and imported or embedded from the web. The students are encouraged to join the discussion forum posting their topics of concern, the Moodle platform also works as an address book from which each student can easily get in-touch with one another and with the teacher by searching from the course participants.

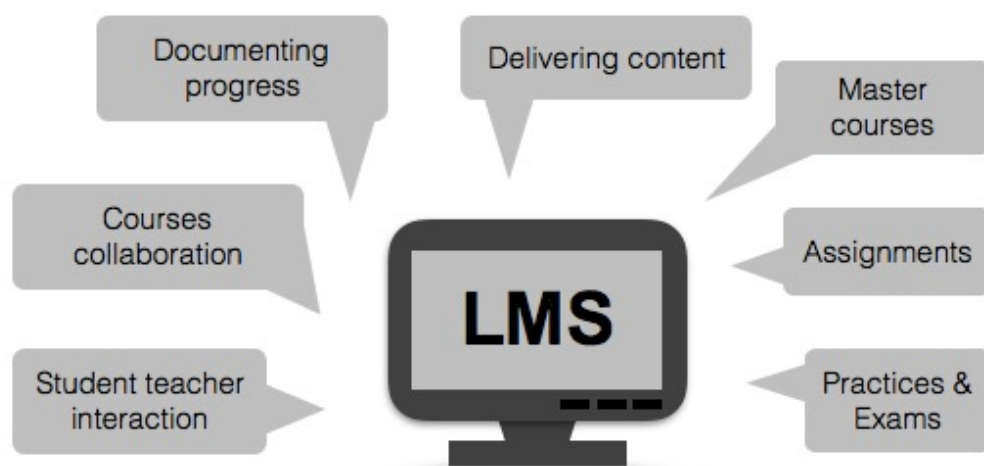


Figure 3. The basic features of Learning Management Systems

The respondent also points out that they are having separate systems for each functionality; they mentioned WinhaWille, Mynet and email systems. Eventually everyone is confident of learning and handling the systems, although it may be frustrating for someone who is not technically oriented.

Online education in other form –MOOCs are enabling the monolithic approximately one-hour lecture material to break down to short modular units of eight to 12 minutes, the concept is not separate instead represented and explained in an accurate way. Students can traverse the material in different ways depending on their background of education, and their personal preference and time management. The benefits of selecting particular enrichment topic that each student want to dig further into is made possible. (Koller D. 2012)

The respondents majoring in information technologies have agreed with the concept of moving into the virtual classrooms where they can learn bits of information regarding their levels of skills. Especially forming a basic understanding about certain topic, where they could skip or redo lectures and assignments depending on their individualistic needs. Education is moving from one-size-fits-all model to personalized curriculum.

4.2 Student centricity

Student centricity is an approach for which the aspects of the role of student is in the centre. This can be considered as user-centred-design, the same applies for student centricity, where students are the customers and their demands and needs are trying to fulfil. From the interviewees most of them are experiencing the effort made that the course materials are being made easier to interpret, since the absence of the expert guidance – the teacher is not involved in real-time.

The teaching content is often divided into more sections, when handling more specific topic in a large scale. The learning material is being recorded into few minutes' sessions, while it made easier for students to engage into the video or audio content, the process and effort to record such media file is put. Students recognise the well-planned lecture recorded and they are aware that the course material is designated for information transmissions. Not only the students are satisfied with the course content delivered but also rewarding for the delivery of the learning material made by the other side. It means the success of pedagogical change and transmission of knowledge to the students.

In many ways, educational research indicates that the teacher's voice still plays an overly dominant role in teaching. Which means the audience is only receiving such information not only passively but receiving the information from a subjectively presented view. The activation of the students is the key to student-centric teaching. The respondent indicates that even though in discussion forums the teacher is encouraging raising voices and questions, however it is still quite silent to be a forum where discussions are held. Therefore, many Moodle courses are requiring posting questions or topics into the forum, the respondent indicates that that way the forum was made into an email-box where participants just hand-in their assignments.

4.3 Size of the online classroom

The importance of delivering of instructions from instructors to the students in a way that students are getting engaged to the new learning environment. The most convenient answer is

to approach them socially; via current giants of social media applications they are using. The role of social media in delivering and integrating with our learning management systems can't be ignored, since social media is daily-updating news from various field even areas of education.

Teaching online has also another component of restricting the size of enrolment, I believe that engaging limited number of students for certain courses that need more assessment on discussion forum conversations and interactions directly with both teachers and students will produce better results overall.

From the survey of computed data, the ideal traditional class size was 17 students while the ideal online class size was 12 students (Lawrence 2004). From my observation, nowadays people accepted to the online courses are approximately 30- 40 people per semester of the course. It is almost the same as for traditional classrooms.

The most misleading abstract may be that why won't the administrator of the online course be handling hundreds of students. Further, the answer is very simple, even though there are no office hours, classroom presentations, nor hand-written assignments it is still considered a normal workload for a teacher. Thus, online teaching should not be categorized as a panacea for overloading student enrolment and increasing one's revenue.

4.4 Raising awareness of plagiarism in the online classrooms

Raising awareness of plagiarism in the online classrooms. Creating videos and humanizing the message for example by creating video formats to represent topics are one way to inform viewers about the issue. Recommended by Oliver HedgePeth (2015), telling a story about plagiarism in the video and encourage students to discuss and review the video would help reduce plagiarism since students will be well informed of seriousness of the case.

Instructions applied should be clearly stated and posted in the relevant page in the course info and platform, where students are granted access. Engaging students' participation via social media platforms are ideas involving, but often social media sites have too much spams, since marketers are exploiting social media platform for marketing purposes. In my opinion, with restricted platforms for information delivery is enough.

Distractions online are mundane, but reducing it to LMS and certain social media platforms are still usable. For example, Microsoft combined with school email system are offering shareable folders for editing online and discussion forums and video chatting via Skype.

4.5 The effectiveness of deployed technology in education

Innovation and its disruptive technologies have great potential to lead transformations in higher education. The devices disruptive for example mobile devices for communications, are to be nominated successful in learning languages. Since social media is enabling people to know each other in such relation levels from six-degrees, the possibility to enhance learning experience from peer-to-peer support are easier.

E-learning is now divided into three categories as now observed, the blended learning is an effective integration of the two components both face-to-face and Internet communication technology, producing a result that is that no two blended learning designs are identical. (Garrison & Cleveland-Innes, 2003; Swan, 2001.)

There are multiple ways of enhancing one's studies, the possibilities for choosing best suitable one is being offered. In E-learning there are three possible ways to study, it is either enhanced, or online, the third one is the combination of previous two. Blended learning is to be distinguished from enhanced classroom or online learning experiences. (Garrison D.R., Kanuka. H.2004.)

The respondents, on the other hand, are pointing out that they do not know or have not noticed how many students there are in the online courses provided by their own universities. This is an indication of lack of peer engagement. The importance of exchanging knowledge and ways to learning are made impossible, if the participants are unaware of fellow students' opinions about related topics. They may spend more time online searching for the answer but unwilling to post a question request in the forum, which of course will be answered at least by the responsive teacher.

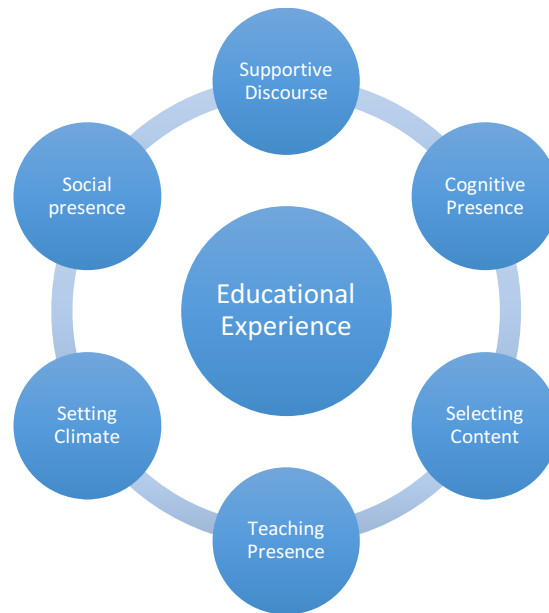


Figure 4. Community of Inquiry. (Garrison D.R., Kanuka. H. Internet and Higher Education 7 (2004) 95-105.)

According to Garrison D.R. and Kanuka H. (2004), education experience constitutes a wide varieties of components a blended learning is a better solution for combining synchronous verbal and asynchronous written communication in the context of a cohesive community of inquiry. The blended learning often presented as partly online courses among universities of applied sciences in Helsinki have the feature of introducing the course content and preliminary learning requirements to the students. The participants are able to choose whether or not to take more contact lessons in order to maintain one's schedule finishing towards the goal. Therefore, support in higher levels of learning through critical discourse and reflective thinking are being offered.

4.6 Other potential technologies

So far, all respondents didn't mention smart phone as their major learning device. Either they are using personal computer or laptop. Potential technologies may feature smart tutors which guide and assist online classroom learning experience. The field of opening new online portals for virtual courses are competing with each other, as it is known, technology need to be to be updated every now and then. Since portals such as Coursera and Edx are only offering courses from certain universities, other countries are developing university online education portals to enable course offerings in private and limited platforms. The respondent with business information technology as one's major, did mention that she took an online course about programming in TechClass from Haaga-Helia University of Applied Sciences co-operation partner Metropolia University of Applied Sciences. That was one and independent e-learning portal in Finland for higher education students. Also, she took another innovation courses from the

same university but having it on Eliademy, which represents another platform for online courses. The main aspect stays at delivering the educational content from teachers to the students. However, there are some systems that enhances the individual work done on the other side of the electronic device.

Mentioned by Eftekhari teaching computer sciences from Metropolia UAS in his email to the students enrolled to his courses; one of their new set of goals contains the smart assistant system (SAS) to help students learn material easier and developing smart text recognition system (STRS) to guide the students with their tasks and enrolments. His courses were enrolled with more than 431 students (only open university courses) and only 40 percent of them have passed the courses. The feedback was measured as 92.5% satisfied, but the employment rate is lower – only 7 students have their jobs through TechClass connections.

To be put briefly, students' involvement with communication channels such as social media features may be another feature to be added to learning platform, however it must be kept separately. The engagement rate is not as high as in contact lessons kept offline classrooms. It is estimated by the respondents that their procrastination and lack of guidance in new environment of learning platforms weakens the motivation to do the virtual course as a whole. Individual work seems more difficult to finish, moreover group work assignments are being finished even if some of the team mates does not collaborate enough but the teamwork does some reminding for procrastinators not ruining others efforts.

5 Results

Results obtained from the interviews while meeting people face-to-face, it is possible to observe the direct emotions of each participant, and in such cases the interviewer is stuck in a conversation with the interviewee in a personal level. This provides data on what is currently available on the opinions proposed by the interviewees. To take a notice into each participants' reactions on interview requests, many requires to see the questions beforehand to prepare themselves.

From the interviews, there are discovered associations that between variables of similar traits. All respondents were not satisfied with the plain and dull outlook of their school's learning management system, especially students majoring in sciences and technology were not happy with an indication that having just basic features sure is not enough to increase their study motivations.

The evidence of producing different aspects of this research is, to be blunt, rather restricted and limited one. Due to each interviewee and their individualistic life it has to be taken account that depending on their lifestyle and decisions of future, their opinions may vary a great deal even if they are majoring in same study programme. The interview groups are geographically situated in Finland, most of them studying in Haaga-Helia University of Applied Sciences, few who are reaching the graduation and several who have graduated. One major group studies business information technology and the other focuses on tourism and multilingual assistant programmes. The similarity of their age, sexes and cultural differences have little effect on their choice of choosing virtual course as a selection for optional study schedule.

Innovation is happening, but not as innovative as it claims to be. Since disruptive technologies are put to education in order to create a breakthrough, the truth is, researchers are eager to try to adapt the theories into practical implementations. Current trends are getting learners engaged into their platforms to experience learning in a new environment, it is a sign of bringing up solutions for learning courses in any forms delivered for example, Moodle, MOOCs, and other social media platforms letting users to create contents for learners to observe.

While the question in the interview was asking usages and recommendations of online courses, few have said anything against affording online courses to enhance their experiences relating to the study topic. As one of the business information student put it shortly “- - I have great interest in digital media technologies, as in tourism, it is vastly needed for promoting

one's business overall - -", therefore it is to be said that individualistic decision is determinant factor of choosing courses online.

The outlook of learning management system is being considered plain, but containing all necessary information students and teacher needs in order to attain desired functionalities. LMS is a very complex word for the respondents, since few of them actually knew the words by its term. On the other hand, people recognise the term Moodle and they knew that it is an open source software.

The optimal number of students per online classroom is not detected, some are not aware of the number of peers per online course. However, one did suggest that "- - about the same amount of students that per responsible tutor is able to handle in a meantime - -". The student centricity is noted by the easiness of understanding the instructions, quality content, and the flexibility of completing the assignments.

The respondents from the interview are in the consensus mind of learning independently in the online courses. They feel positive and happy about the flexibility to fit the learning session into their own timetable. However, they only recommend online courses to those students who really can manage their time and schedule, because always one can turn off those notifications and reminders of course sessions. The interviewees are moderately happy of the content and the quality of the videos and documents they have in MOOCs, though their own virtual courses provided by their own school based on Moodle seems a bit of lacking of the visuals and the content. The interviewees note that learning through online course platforms provides a wide variety of course selections for them from all over the world and it widens up the perspective for example lectures from Harvard.

Another point is that students feel that human-to-human interactions are not enough provided in those virtual courses, since questions are not always answered in real-time and because of the time-zones teachers' presence are lacking. The difficulty of staying on track of the course content without an instructor. The courses are mainly in English and sometimes it is hard to understand professional concepts without simplified explanations.

Unfortunately, increased number of technologies means declined security in higher education. The most concerning thing is plagiarism, and cheating, since it is possible to search answers from the web it is almost impossible to tell if the original content owner is who since everything could be posted on social media even from unknown sources. The interview respondents feel insecure of their published content and answers.

5.1 The other aspects

Depending on the nature of the subject, combining both hours of face-to-face contact lessons and virtual classes are the best option of alternatives. Some respondents feel that getting certificates from well-known university courses are not a proof for knowledge since they are just only courses, one can get an excellent grade putting maximum effort and a less fancy grade doing less. They also think that the pursued certificates are less worthy than ones obtained from real-schools since companies look into school diplomas more.

The future development of online classrooms is still a rising trend, however, the satisfaction of gaining something from the online courses shall be distinguished. For some “- - online course provide a third platform to better understand concepts and solutions from programming geeks - -”, and the group with more human interactive sessions “- - it is not always easy to negotiate online since we cannot see each other’s face neither emotions and thus give a direct response in real-time - -”. The respondents are arguably unsure about the value what the online courses has to give in the job market, but there’s some certainty about getting more insights on various subjects they are offering in online educational platforms.

Another point is that online courses are more technology driven, for example one who studied computer science told me that programming is taught by many online and it is comfortable to search answers and tricks from related discussion forums. It is also that people are more likely to study something what one really is passionate of, so online courses provide such a path to self-development.

6 Evaluation and Conclusions

Results evaluation and validity

The goal is to evaluate modern technologies as they are described as disruptive against education. It was fascinating and same time upsetting to see the results, as they were, ideas are invented all the time but weren't all applied anywhere. Innovation in its term means impacting on social activities – the way that both the innovator and the society benefits from it. High-end technologies are supposed to meet their expectations, the impacts, however comes with errors and delays. There are certain traits that can't not be predicted and measured such as human behaviour and environmental effects.

Fortunately, details of sub research questions do provide more in-depth understanding of how online learning is affecting people's thinking and behaving overall. The countermeasures for risks and problem statements are facing their challengers with strategies which are in a development stage. Current solutions do impact learners in a positive way to offer reliable content from educational platforms made by famous universities. However, disruptiveness in education is not but rather in e-learning –the way of delivering multimedia and learning materials in any digital forms.

Theoretical framework was built from the end of 2016 till Spring 2017, the break of time period of constructing theoretical part and the empirical part producing the results may have led to a variation in results. Interviews are composed of both conversations face-to-face and via network skype-meetings and voice calls, thus immediate reactions emotionally cannot be fully observed. It may as well affect the mood of the interviewee if the respondent could bluntly express oneself in a more comfortable way.

Details of some the interview participants and transcripts of each interview can be retrieved in a file in google docs. Few have little interest putting their personal information publicly, or otherwise revealing their name, age, sex, religion or other relevant indications of the person.

Methods and tools evaluation

Theoretical part was pure reading and reconstructing within the articles and publishers' thoughts. Key concepts are introduced from previous researches, as well as inventions from the public figures who have gained international recognition with their theories published within books and articles.

The other part of observing and retrieving the empirical part was more time consuming than expected since it was putting up together both experience-based observations and analysis from the interviews. The qualitative method used was enough to obtain immediate thoughts and suggestions from the target group. For the recording I used an application called 'Recorder' which is a totally free and downloadable from the Apple Store, another device I used for recording interviews are QuickTime programme in the laptop, it was easy to record and quality maintains high, since I used it to record the voice within the laptop in a Skype voice call. Files were then uploaded to the Google Drive as a copy.

Project management

I have presumably a clear notion of this challenge of writing a thesis. In order to finish the thesis on time and hand in the final report before the ultimate deadline. The essence of planning the project management for finishing off thesis is a phase that shall not be skipped, however it is difficult to stick on to the plan.

Though I already had a topic on mind before submitting the thesis proposal. It is challenging to stay in one topic and to suppress the areas of researches since finding more interesting topics comes along the way of writing. Documenting of project phases that are already finished or that are still unfinished creates an emphasis of what has to be done yet.

When it comes to the project management schedule, my confession is, the management of schedule is poorer than I thought. I have printed out the 100-days-plan for writing thesis but failed after marking five days in a row. I figured out that it is better for me to mark down each finished heading and page number, to track the writing process. It is also helped me to see a big picture of how far I had gone with this research paper.

Personal learning

The process of writing the research paper is, I think, compelling, persuasive, and I overcame a lot in the writing phase since I was reluctant to referring to others while writing I have to admit it was much easier to just jot down relevant point ignoring other public figures and their opinions based on relevant field of research. The point is that, I have learnt patience to study materials for a certain topic with few sub-questions.

The success of fighting against an enormous barrage of negativity, of approaching people for interviews and typing down the transcriptions from audio files. I have searched through the

web for applications to transcript out texts from audio files, their applications worked but there are more errors than hope. In the end, I had to evaluate each audio file again from the very start for analyses.

Potential flaws

The research question is almost impossible to be fully answered, since the technology is being developed and adjusted throughout the process of learning experience design. Whether one technology is being successfully implemented to the curricula of certain topics of education, and affecting students producing the most beneficial outcomes is unpredictable since people are in ways too different and they learn by their own methodologies.

Secondly, regarding theoretical problems and conceptual problems are that the key terms, on one hand they are intriguing curious minds to investigate the true meanings behind the words while applying the theories to the society. On the other hand, it might be that researchers are too keen on explaining and categorising terms that have no concrete bodies to be applied to current trends. Innovation and disruptive technology are linked together, the product offering is a change product, which implies to the societal norms and suggesting new way of thinking and how we do things.

Thirdly, my strategy used in the research is limited. I had reviewed both articles, books and online published books regarding my thesis topic, and searched through more terms relevant to my thesis. There might be some age-old theories that were now criticized or new theories popping up continuously and not being able to mentioned in my thesis.

The interview group was focused on people studying business information systems and the other group having a degree on tourism and multilingual assistance programmes in Haaga-Heilia University of Applied Sciences. There was only six people who were willing to donate some time for me to interview them face-to-face and few were interviewed through skype call since they called themselves too busy to have private life. What I'd do better if the interview were having more students of both groups, although the respondents are giving quality and personal reviews regarding e-learning their knowledge of online education seems less.

Lastly, the research quality is addressing the value of the research. There's hardly any topic that isn't being written before in a way or another. Opinions might be brought up in other articles related to the topic that I had chosen now. The problem lies that how fast the technology enables researchers in certain topics to bring up new ideas and implementation that is applicable to the current education in the field of e-learning.

7 Summary

Even if the results are somewhat stabilising itself from left to right. We can still see that people are willing to try-out fancy things, that enhances their life experiences as people spend lifetimes studying in various prosperous levels. However, education is a complex business service in which its quality is undefined. As Brown and Seely (2006, 9.) have described earlier, successful disruptive innovation in education means a technical breakthrough of the product offerings. Secondly, for disruptive technology a new business model which is built around educational program quality is needed.

The disruption in terms of content is content up-to-date and adaptive to the interests of the users –learners and also adaptable by teachers. Therefore, current disruptive technology platforms that are delivering educational content that need to diversify, in order to blend into a highly personalized service.

Even though, traditional learning continues as a mainstream adoption; disruptive technologies such as MOOCs are the favourite hype now, since it is disruptive in ways that enables the open university courses to be available. Some new features are added to it, highly valued content from famous universities around the world also appreciated professors deliver learning materials for everyone who have enrolled to the course.

The question maintains unanswered, if there's a strong motivation for current providers of education to engage in a disruptive model. Clearly enough, replacement from traditional learning is out of question, on the other hand e-learning provides a referencing material beside face-to-face learning in a real-life class. In the end, current disruptive technologies are being invented to deliver learning materials in new forms rather than disrupting the education to its content.

8 Further research

In the last chapter of the research paper, I came up to two major ideas how would the research be continued further. Since people learn differently in various prospects and the learning process is life-long, therefore it is important for business entities to understand and choose suitable programmes to educate people in higher level of education. Secondly, to understand the risk and to protect private data using different levels of internet connections and accesses to LMS in a business level are relevant field of research.

More personalized virtual courses

The problem is not only in higher education but also in other educational entities as well. For example, in occupational trainings that keeps the staff up-to-dated to the current situations of the world and the society. Information must be selected and conducted in such a way that enables learners to absorb the core idea more effectively through personal owned technology devices other than gathering people together for multiples of mass media announcements.

The combination of contact lessons and virtual lessons are rising its popularity. Many students feel that they are having their time wasted by adapting to the common teaching method at school, when they could learn something more conveniently and more effectively by their own way. The first and foremost idea is to tailor a personal e-learning experience for each individual, we get selected our own major also, so it would be challenging to enhance our individualistic course preferences too on each course.

Fortunately, the method of learning online is being implemented to our curriculum. However, such individualistic tailoring of the class content is not responded. It is also matter of subject of which could be adapted to such changes.

LMSs security within mobile devices

Secondly, remote learning and choosing the right device for reaching such course content. The most used technology devices are the mobile phones, since there's an optimal number of users who went to higher education. Personally owned mobile devices are increasingly being used to access enterprise systems and cloud-hosted data –both browser-server-based which are compatible with mobile applications. Further research identifies the risks, and threats to

both personal and enterprise wide problems providing solutions found regarding to the research problems when learning management system is considered as core function of an enterprise.

Most of the leading LMSs have mature security practices including back-end infrastructure, strong use of SSL, single sign-on and adhere to certifications such as SOC 2, and external audits (Chetwynd 2016). Moreover, the other group who carries responsibilities are the end-users, who despite the warning of data leaking simply lacks the interest to use a password manager, or enabling two-factor authentication.

Learning management system vendors are taking care of back-end infrastructure and process security, however the attackers know that the end-users are a much easier target. Rolling back to look in-depth of the security in the LMS industry of which is a software service where entities and individual upload from tiny fractures of information to sensitive data. Competitive advantage is at a loss if disaster occurs, or worse compliance infringement and lost public image.

By the time when people get concerned with the security problems phishing attacks are already occurred. Phishing attacks are where single user's login details are being compromised. It is like a wide-spread virus that leaves us in a nightmare followed by multiples expletives. LMS systems users often uses other applications to support their activities to store information and backups in the cloud systems.

Recently Google Docs users were attacked with a sophisticated phishing scam (Levin 2017). Once affected by the malicious third-party web app which is also named 'Google Docs', which gives the malware an access to one's personal email and address book, thus everyone in one's social network will eventually be the target of the phishers.

Further research is to be identifying the social media network relations to learning management systems securities, as given credentials to third party applications and programmes. Although the devices people are using LMS are personal owned, it is possible to receive one of the phishing attacks as long as the network is on while giving out credentials in the belief of trust.

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